PEBBLE PROJECT DESCRIPTION

Pebble Limited Partnership (PLP), proposes to develop the Pebble copper-gold-molybdenum porphyry deposit (Pebble Deposit) as an open-pit mine, with associated infrastructure, in southwest Alaska. The Pebble Deposit is located approximately 200 miles southwest of Anchorage and 60 miles west of Cook Inlet. The closest communities are the villages of Iliamna, Newhalen, and Nondalton, each approximately 17 miles from the Pebble Deposit, and Kokhanok, which is located 3 miles to the northeast of the proposed road from the port site to the south ferry terminal on Lake Iliamna (see Figure 1).

PEBBLE PROJECT COMPONENTS

The Pebble Project as proposed consists of four facility and operations components:

Mine Site and Associated Facilities (see Figure 2)

- **Open pit mine**, developed in stages, with each stage expanding the area and deepening the previous stage. Final dimensions of the open pit would be approximately 6,500 feet long and 5,500 feet wide, with depths between 1,330 and 1,750 feet.
- **Mine site mineral processing facilities** include a crushing plant, coarse ore stockpile, grinding plant, froth flotation circuits to produce concentrates, and concentrate filters to remove moisture before shipment.
- **Copper-gold concentrate** would be loaded into covered bulk shipping containers and transported by truck to the Amakdedori Port. **Molybdenum concentrate** would be bagged and containerized before shipping to Amakdedori Port.
- **Tailings Storage Facility** located within the North Fork Koktuli watershed:
  - 1.1 billion tons storage volume.
  - separate cells for bulk and pyritic (lined) tailings.
  - four embankments: main (600 feet high), south (350 feet high), and east (60 feet high) perimeter embankments and an internal embankment (420 feet high) separating the bulk and pyritic tailings cells.
- **Low Grade Ore Stockpile** up to 330 million tons of mineralized material, segregated by relative value, and PAG waste rock; placed on an engineered liner to control seepage losses through the stockpile.
- **Waste rock** - Non-potentially acid generating (NPAG) waste rock would be used to construct various mine site structures, including the TSF embankments and mine site roads. PAG waste rock would be stored within the LGO stockpile until mine closure, and then back-hauled into the open pit.
- **Overburden Stockpile** segregated to the southwest of the open pit, and surrounded by a berm of non-mineralized rock to contain the material and increase stability.
- **Water Supply, Management and Treatment** consists of five components:
  - potable water well field and treatment plant.
  - two water management ponds (Open Pit and LGO/Main).
  - Multiple ponds in North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek drainages.
  - Three seepage ponds (South, West, and Main Embankment).
  - Two water treatment plant/three discharge locations (North Fork Koktuli, South Fork Koktuli, and Upper Talarik Creek drainages).

- Multiple fuel tanks, located in a dual-lined and bermed area.
- **Personnel camps** include a main construction camp to accommodate 1,700 workers, later refurbished for 850 rooms for operations.
- **Power generation** capacity and distribution infrastructure: 230 megawatt delivery capacity fired by natural gas and a 69-kilovolt distribution system.

Amakdedori Port Site (See Figure 3)

- **Ore carrier vessels** up to 40,000 dead weight tons and 700 feet in length, up to **25 Handysize ships will be required annually** to transport concentrate.
- Up to **30 marine line-haul barge loads of supplies and consumables** will be required annually. **Two ice-breaking tug boats** will be used to support marine facility operations.
- **1300 foot earthen access causeway/700 foot wharf** extending out to a marine jetty located in 15 feet of natural water depth.
- **Access channel and turning basin,** dredged to 50 foot depth.
- **Shore-based facilities** to receive and store containers and fuel, two, 2-MW natural gas power generators with an emergency diesel generator, a natural gas compressor station, maintenance facilities, employee accommodations, and offices.
- **Fuel storage** consisting of four 1.25 million gallon tanks inside a lined ad bermed area

Transportation Corridor (see Figure 3)

Road System Connecting Amakdedori Port to the Mine Site

- **Private, double-lane road extending 30 miles south from the Mine Site to North ferry terminal** on the north shore of Iliamna Lake.
- **Private, double-lane road extending 35 miles southeast from the South Ferry Terminal to the Amakdedori Port** on Cook Inlet.
- **Eight bridges**, six of which would be single-span, two-lane bridges that range in length from approximately 90 to 170 feet. There would be one large (550 feet) multi-span, two-lane bridge across the Newhalen River and one large (455 feet) multi-span, two-lane bridge across the Gibraltar River.
- Daily transportation of concentrate, fuel, reagents and consumables would require **up to 35 truck round trips per day for each leg of the road**, including three loads of fuel per day.
- **Village surface road connections** from the transportation corridor to Iliamna, Newhalen, and Kokhanok.

Ferry Service and Terminals on Lake Iliamna

- **18 mile ferry crossing of Lake Iliamna.**
- **All-season icebreaking ferry** with 12 crew members.
- **Inbound supplies from the Amakdedori Port to the Mine Site** and **outbound copper-gold and molybdenum concentrates, backhauled waste, and empty containers.**
- **Average of one round trip ferry per day.**
- **Two ferry terminals,** with 40 foot rock/aggregate causeway, container handling and storage facilities, office and maintenance buildings, and local power supply.

Natural Gas Pipeline System (see Figure 1)

- **188 mile 10-12 inch diameter natural gas pipeline**, buried 3 feet deep onshore, in five segments:
  - starts on the eastern shore of Cook Inlet at Happy Valley near Anchor Point along the Sterling Highway.
  - 94 mile subsea pipeline crosses Cook Inlet to the Amakdedori Port Site.
  - 35 mile buried pipeline adjacent to the road from port site to south ferry terminal.
  - 18 mile pipeline across Lake Iliamna.
  - 30 mile buried pipeline adjacent to the road from north ferry terminal to Mine Site.
- **Two gas fired compression stations**, one on the eastern end at Anchor Point, and one at the Amakdedori Port.
- **Buried fiber optic cable** adjacent to pipeline.

PROJECT CONSTRUCTION

- **The project would take approximately four years to construct,** on four main project components – Mine Site, Amakdedori Port, Transportation Corridor, and Pipeline.
- **Transportation infrastructure to access the site is the first step**, along with Pre-production Phase environmental protection systems, and temporary facilities that support construction crews (camps at port site, mine site, ferry terminals).
- **Initial access to the mine site within one year,** followed by earthworks, plant facilities, tailings storage embankments, stockpile foundations/liners, and water treatment facilities.
- **Natural gas line installation** will occur during the second and third construction years.
- **Completion of Pre-production Open Pit, power plant and processing facilities** in year 4.
- **Construction employment** estimated at 2,000 workers.

PROJECT OPERATIONS

- **Project operating life of 20 years**, **three mining phases –** pre-production, production and stockpile reclaim.
- **Conventional open pit mine** - drill, blast, truck and shovel operation.
- **Blasting events –** once to twice a day.
- **Tailings Storage Facility water management** - Control, collection, and recovery of tailings water for recycling or treatment prior to discharge; seepage collection system below impoundment structures; freeboard to contain inflow design flood.
- **Total material mined** - 1.2 billion tons over the life of the project.
- **Mining rate** up to 90 million tons per year, **milling rate** up to 58 million tons per year.
- **Annual concentrate production** – 600,000 tons copper gold, 15,000 tons molybdenum.
- **Operations employment** estimated at 850 workers, two shifts per day, 365 days/year.

PROJECT CLOSURE

- **Reclamation and closure jurisdiction** – Alaska Dept. of Natural Resources Division of Mining, Land, and Water, and Alaska Dept. of Environmental Conservation.
- **Design for Closure** – early consideration of requirements for Closure and post-Closure site management.
- **Segregation of the bulk and pyritic tailings storage cells** to facilitate Tailings Storage Facility closure.
- **Potentially Acid Generating waste rock** backhauled to mine pit for subaqueous storage.
- **Comprehensive water management plan** that strategically discharges surplus treated water to downgradient streams in a manner that reduces the effect of flow changes on stream flow and fish habitat.
- **Removal of mill and other infrastructure** not required for closure and reclamation.
- **Reclamation of disturbed areas** through grading, use of top soil as need and revegetated.
- **Road system retained** as needed for post closure activities and monitoring.
- **Pit lake water quality will be monitored;** water will be treated and discharged before levels approach elevation where groundwater flows outward from the open pit.

For more details, see Attachment D Project Description, Department of Army Application for Permit (POA-2017-271) on www.pebbleprojecteis.com.

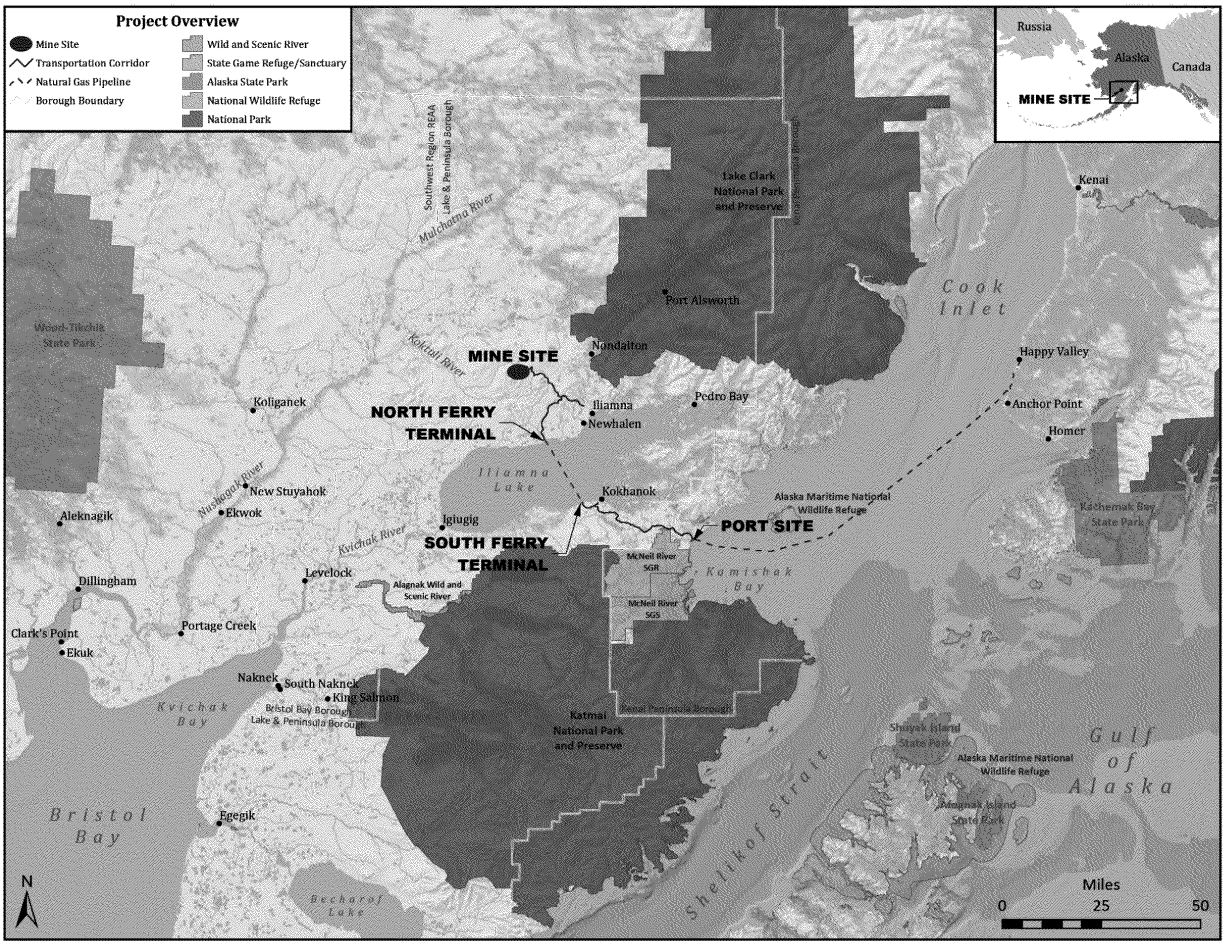
Project Overview
Mine Site
Transportation Corridor
Natural Gas Pipeline
Borough Boundary
Wild and Scenic River
State Game Refuge/Sanctuary
Alaska State Park
National Wildlife Refuge
National Park
Russia
Alaska
Canada
MINE SITE
Southwest Region REAA
Lake & Peninsula Borough
Kenai Peninsula Borough
Lake Clark National Park and Preserve
Mulchatna River
Kokaul River
Port Alsworth
Nondalton
MINE SITE
NORTH FERRY TERMINAL
Koliganek
Iliamna
Newhalen
Pedro Bay
Kenai
Happy Valley
Anchor Point
Homer
Cook Inlet
Wood-Tikchik State Park
Nushagak River
New Stuyahok
Ekwok
Aleknagik
Iliamna Lake
Kokhanok
Alaska Maritime National Wildlife Refuge
Kachemak Bay State Park
Kvichak River
Igiugig
SOUTH FERRY TERMINAL
PORT SITE
McNeil River SGR
McNeil River SGS
Kamishak Bay
Dillingham
Levelock
Alagnak Wild and Scenic River
Clark's Point
Ekuk
Portage Creek
Naknek
South Naknek
King Salmon
Bristol Bay Borough
Lake & Peninsula Borough
Kvichak Bay
Katmai National Park and Preserve
Kenai Peninsula Borough
Shuyak Island State Park
Alaska Maritime National Wildlife Refuge
Gulf of Alaska
Shelikof Strait
Bristol Bay
Egegik
Becharof Lake
Afognak Island State Park
N
Miles
0
25
50

Figure 1

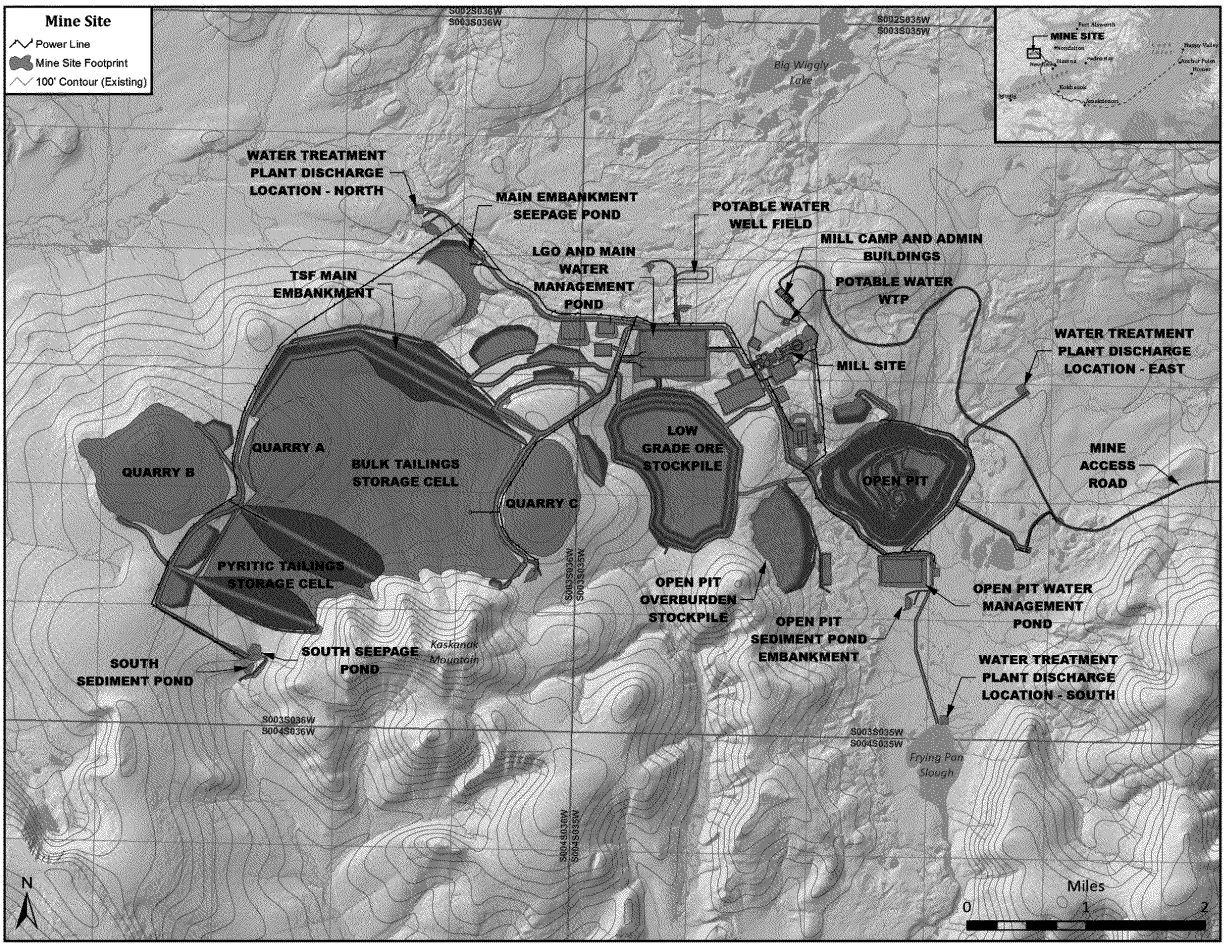
Mine Site
Power Line
Mine Site Footprint
100' Contour (Existing)
MINE SITE
Big Wiggly Lake
WATER TREATMENT PLANT DISCHARGE LOCATION - NORTH
MAIN EMBANKMENT SEEPAGE POND
POTABLE WATER WELL FIELD
MILL CAMP AND ADMIN BUILDINGS
LGO AND MAIN WATER MANAGEMENT POND
TSF MAIN EMBANKMENT
POTABLE WATER WTP
WATER TREATMENT PLANT DISCHARGE LOCATION - EAST
MILL SITE
QUARRY A
QUARRY B
BULK TAILINGS STORAGE CELL
LOW GRADE ORE STOCKPILE
OPEN PIT
MINE ACCESS ROAD
QUARRY C
PYRITIC TAILINGS STORAGE CELL
OPEN PIT OVERBURDEN STOCKPILE
OPEN PIT WATER MANAGEMENT POND
OPEN PIT SEDIMENT POND EMBANKMENT
SOUTH SEEPAGE POND
SOUTH SEDIMENT POND
Kaskanak Mountain
WATER TREATMENT PLANT DISCHARGE LOCATION - SOUTH
Frying Pan Slough
N
Miles
0
1
2

Figure 2

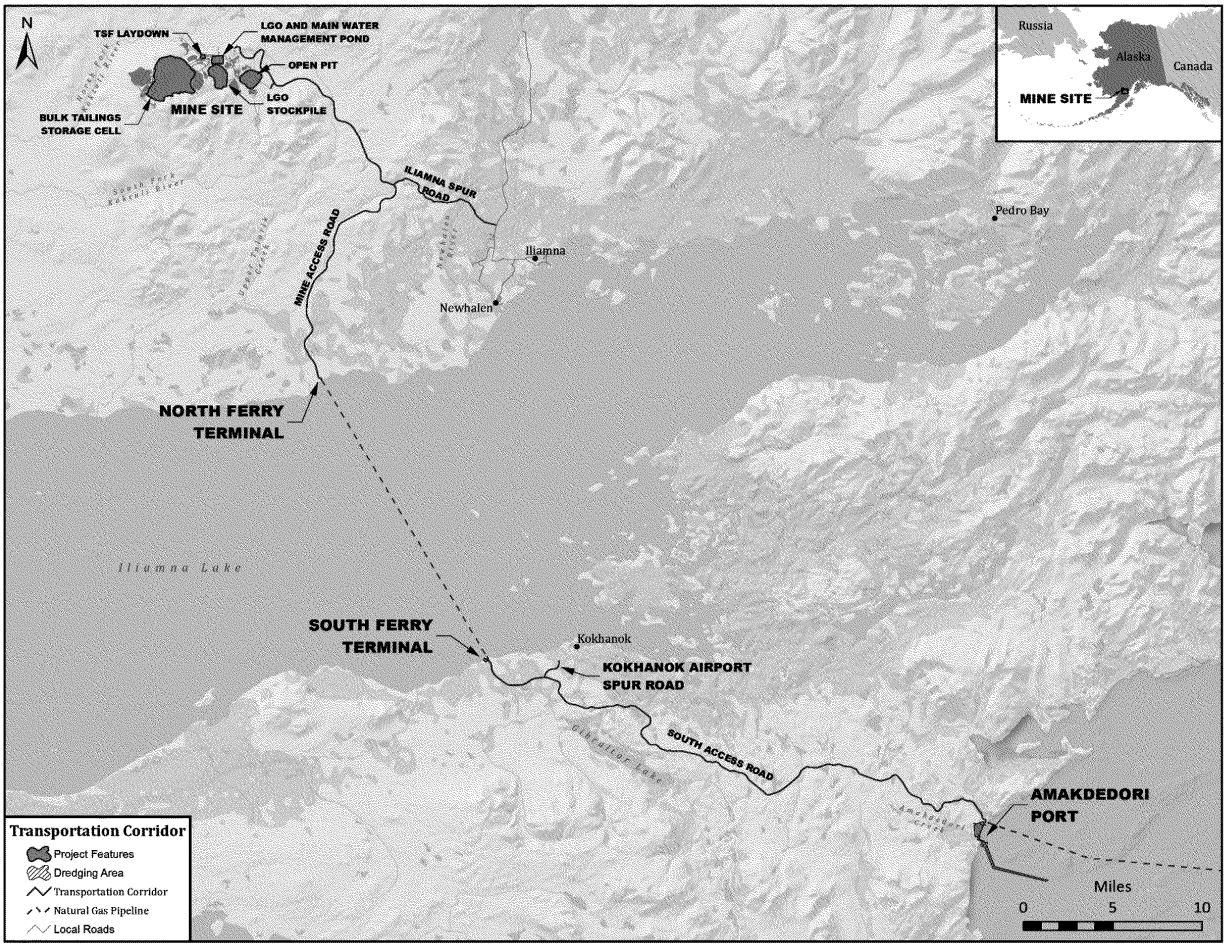
N
TSF LAYDOWN
LGO AND MAIN WATER MANAGEMENT POND
OPEN PIT
LGO STOCKPILE
MINE SITE
BULK TAILINGS STORAGE CELL
ILIAMNA SPUR ROAD
MINE ACCESS ROAD
Iliamna
Newhalen
Pedro Bay
NORTH FERRY TERMINAL
Iliamna Lake
SOUTH FERRY TERMINAL
Kokhanok
KOKHANOK AIRPORT SPUR ROAD
SOUTH ACCESS ROAD
AMAKDEDORI PORT
Russia
Alaska
Canada
MINE SITE
Transportation Corridor
Project Features
Dredging Area
Transportation Corridor
Natural Gas Pipeline
Local Roads
Miles
0
5
10

Figure 3